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PATENT
Atty. Dkt. No. YOR920030416US1REMARKS

In view of the following discussion and claim amendments, the Applicants submit that none of the claims now pending in the application are anticipated or obvious under the provisions of 35 U.S.C. §102 and §103. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 1, 3-9, AND 12 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 1, 3-9, and 12 in the Office Action under 35 U.S.C. §102(e) as being anticipated by the Liu et al. patent (U.S. Patent No. 6,642,129, issued November 4, 2003, hereinafter referred to as "Liu"). The Applicants respectfully traverse the rejection.

The Examiner's attention is directed to the fact that Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as positively claimed by Applicants' independent claim 1, from which claims 3-9 and 12 depend.

By contrast, Liu discloses a probe array for nanolithography applications in which individual probes are actuated by "resistive heater[s] patterned onto ... silicon nitride cantilever[s]" (See, Liu at column 6, lines 1-4, emphasis added, and Liu at column 6, lines 24-28). That is, the heat emitting surfaces (*i.e.*, resistive heaters) taught by Liu are not embedded in heating means, as claimed by the Applicants, but rather are deposited or patterned onto the exterior surfaces of cantilevers (See, e.g., Liu at FIG. 5, element 66).

Moreover, Liu fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also positively claimed by Applicants' independent claim 1.

By contrast, Liu teaches that the heat emitting surfaces (*i.e.*, resistive heaters) are used to actuate (*i.e.*, physically maneuver) the cantilevers, so as to selectively put probes in contact with substrates. See, e.g., Liu at column 2, lines

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56-58 ("When a current is applied through the resistive heater, heat is generated due to ohmic heating, thus raising the temperature of the resistor as well as the cantilever. Due to difference in the thermal expansion coefficient of materials for the cantilever and for the metal resistor, the cantilever will be bent selectively in response to the applied current", emphasis added). Thus, the heat emitting surfaces taught by Liu are not used to heat reactants or to facilitate chemical reactions, as claimed by the Applicants, but to induce movement of probe tips in relation to substrates.

Liu therefore fails to disclose or suggest every limitation of the Applicants' independent claim 1. Specifically, Applicants' independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:
providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface embedded in said heating means;
providing at least one reactant on the local region of the object; and
selectively heating the at least one reactant on the local region using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object in which a heating means positioned proximate to a local region of the object includes an embedded heat emitting surface. At least one reactant is selectively heated on the local region using the embedded heat emitting surface. In an exemplary embodiment, at least one reactant at ambient temperature is supplied to a local region of the object (See, e.g., Applicants' specification at paragraph 0021). A heating means is provided with a small heat emitting surface that locally increases the temperature of the reactant (See, e.g., Applicants' specification at paragraphs 0017 and 0025). The high temperature of the reactant facilitates a local chemical reaction that forms the desired microstructure. (See, e.g., *Id.*)

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As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' Independent claim 1. Therefore, Liu clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 3-9 and 12 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claims 3-9 and 12 are also patentable and not anticipated by Liu. As such, the Applicants respectfully request the rejection of claims 1, 3-9, and 12 under 35 U.S.C. §102(e) be withdrawn.

II. REJECTION OF CLAIMS 10-11 AND 13-17 UNDER 35 U.S.C. § 103

A. Claims 10-11

The Examiner has rejected claims 10-11 in the Office Action under 35 U.S.C. §103(a) as being unpatentable over Liu in view of the Demers patent application (U.S. Patent Application Publication No. 2004/0101469, published May 27, 2004, hereinafter referred to as "Demers"). The Applicants respectfully traverse the rejection.

As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' independent claim

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1. Demers fails to bridge this gap in the teachings of Liu. Therefore, Liu and Demers, alone or in any permissible combination, fail to render obvious Applicants' independent claim 1.

Furthermore, dependent claims 10-11 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claims 10-11 are also patentable and not made obvious by the teachings of Liu and Demers. As such, the Applicants respectfully request the rejection be withdrawn.

B. Claims 13-15

The Examiner has rejected claims 13-15 in the Office Action under 35 U.S.C. §103(a) as being unpatentable over Liu in view of the Yu patent (U.S. Patent No. 6,291,302, issued September 18, 2001, hereinafter referred to as "Yu"). The Applicants respectfully traverse the rejection.

As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' independent claim 1. Yu fails to bridge this gap in the teachings of Liu. Therefore, Liu and Yu, alone or in any permissible combination, fail to render obvious Applicants' independent claim 1.

Furthermore, dependent claims 13-15 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claims 13-15 are also patentable and not made obvious by the teachings of Liu and Yu. As such, the Applicants respectfully request the rejection be withdrawn.

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C. Claim 14

The Examiner has rejected claim 14 in the Office Action under 35 U.S.C. §103(a) as being unpatentable over Liu in view of the Mirkin et al. patent application (U.S. Patent Application Publication No. 2004/0142106, published June 22, 2004, hereinafter referred to as "Mirkin"). The Applicants respectfully traverse the rejection.

As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' independent claim 1. Mirkin fails to bridge this gap in the teachings of Liu. Therefore, Liu and Mirkin, alone or in any permissible combination, fail to render obvious Applicants' independent claim 1.

Furthermore, dependent claim 14 depends from claim 1 and recites additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claim 14 is also patentable and not made obvious by the teachings of Liu and Mirkin. As such, the Applicants respectfully request the rejection be withdrawn.

D. Claim 16

The Examiner has rejected claim 16 in the Office Action under 35 U.S.C. §103(a) as being unpatentable over Liu in view of the Choi et al. patent (U.S. Patent No. 6,762,402, issued July 13, 2004, hereinafter referred to as "Choi"). The Applicants respectfully traverse the rejection.

As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means

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proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' independent claim 1. Choi fails to bridge this gap in the teachings of Liu. Therefore, Liu and Choi, alone or in any permissible combination, fail to render obvious Applicants' independent claim 1.

Furthermore, dependent claim 16 depends from claim 1 and recites additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claim 16 is also patentable and not made obvious by the teachings of Liu and Choi. As such, the Applicants respectfully request the rejection be withdrawn.

E. Claim 17

The Examiner has rejected claim 17 in the Office Action under 35 U.S.C. §103(a) as being unpatentable over Liu in view of the Field patent application (U.S. Patent Application Publication No. 2003/0222965, published December 4, 2003, hereinafter referred to as "Field"). The Applicants respectfully traverse the rejection.

As discussed above, Liu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object by fabricating or altering a submicrostructure on an object by providing a heating means proximate to a local region of the object, where the heating means includes an embedded heat emitting surface, as recited in Applicants' independent claim 1. Liu also fails to teach or suggest that the heat emitting surface is used to selectively heat a reactant so as to facilitate a local chemical reaction for forming or altering a submicrostructure, as also recited in Applicants' independent claim 1. Field fails to bridge this gap in the teachings of Liu. Therefore, Liu and Field, alone or in any permissible combination, fail to render obvious Applicants' independent claim 1.

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Furthermore, dependent claim 17 depends from claim 1 and recites additional limitations. As such, and for at least the exact same reason set forth above, the Applicants submit that claim 17 is also patentable and not made obvious by the teachings of Liu and Field. As such, the Applicants respectfully request the rejection be withdrawn.

CONCLUSION

Thus, the Applicants submit that all of these claims now fully satisfy the requirement of 35 U.S.C. §102 and §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully Submitted,



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July 25, 2007

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